

Cruise Plan
Regional Monitoring Program
Bivalve Retrieval Cruise #18
September 1-4, 1998

Objectives

The objectives of this cruise are:

- 1) Retrieve bivalves were deployed at 13 sites on June 2-5, 1998.
- 2) Portion bivalves into three groups for analysis of trace organics by Bay Area Dischargers Authority (BADA), trace elements by BADA and Brooks-Rand and condition by Applied Marine Sciences (AMS).
- 3) Bivalves for analysis of trace elements will be homogenized by AMS at UC Santa Cruz on September 14-17, 1998.

During this cruise, mooring integrity will be evaluated by checking for abrasion of lines and security of knots and cable ties. The mesh bags containing the bivalves will be removed from the moorings and brought aboard the vessel where they will be portioned, packaged and frozen on dry ice. BADA personnel will pick up selected bivalves at the end of the cruise.

Personnel

The personnel and work assignments for this cruise are as follows:

Name	Affiliation	Duties	Contact
David Bell	AMS	Cruise Manager, Dive Master	H(510)833-8670
Jordan Gold	AMS	Diver, Vessel Skipper on 9/1	H(510)533-3475
Dave Morgan	Romberg Tiburon Centers	Vessel Skipper	W(415)435-7123 F(510)229-4194
Paul Salop	AMS	Diver, Dive Tender	H(510)465-6907

Mr. Bell will be responsible for all scientific operations and safety. Mr. Morgan will be responsible for vessel operation and safety. Messrs. Gold and Salop will trade off, assisting with bivalve retrievals, assisting the divers in and out of the water, handing divers equipment as necessary and recording data for each station. Mr. Gold will be responsible for vessel operation and safety on September 1.

Cruise Schedule

The following cruise schedule assumes that a maximum of 1.0 hr will be required for vessel operations at each site. Bivalves will be counted, packaged, and frozen on dry ice as the vessel is underway to the next site.

Date	Time	Activity
Day 1 September 1, 1998	1130-1230	Mobilize gear on the vessel R/V M.E. II at the Vallejo Marina. Conduct safety briefing. Depart for Davis Point.
	1230-1330	Examine mooring and retrieve bivalves at Davis Point. Slack tide before ebb at approximately 1301 (Figure 1).
	1330-1430	Transit to Vallejo Marina, demobilize vessel and sort bivalves for analysis. All bivalves will remain frozen on dry ice.
Day 2 September 2, 1998	0830-0900	Mobilize gear on the vessel R/V Questuary at the Emeryville Marina. Depart for Yerba Buena Island site.
	0900-1400	Examine moorings and retrieve bivalves at, Yerba Buena Island, Alameda, Redwood Creek, Dumbarton Bridge, and Coyote Creek. Slack water before ebb at approximately 1107 (Figure 2).
	1400-1430	Demobilize gear at Emeryville Marina, fill up SCUBA tanks as necessary. All bivalves will be stored on dry ice aboard the vessel.
Day 3 September 3, 1998	0930-1000	Mobilize gear on vessel R/V Questuary at the Emeryville Marina. Depart for Horseshoe Bay.
	1000-1530	Examine moorings and retrieve bivalves at Horseshoe Bay, Red Rock, Pinole Point, San Pablo Bay, Petaluma River and Napa River. Slack water before ebb at approximately 1332 (Figure 3).
	1530-1600	Vessel transits to Martinez Marina. Demobilize gear and re-fill SCUBA tanks if necessary. All bivalves will be stored on dry ice aboard the vessel. Bell, Gold and Salop stay overnight at the John Muir Inn, Martinez.

Date	Time	Activity
Day 4 September 4, 1998	0800-0830	Mobilize gear on the vessel R/V Questuary at the Martinez Marina. Depart for Grizzly Bay.
	0830-1030	Examine mooring and retrieve bivalves at Grizzly Bay. Slack water before flood at approximately 1027 (Figure 4).
	1030-1300	Vessel transits to the Sacramento River. The crew will collect <i>C. Fluminea</i> from the Sacramento River area close to the historical RMP bivalve deployment site. At least 150 specimens will be collected using a hand-deployable clam dredge operated from the stern of the vessel.
	1300-1400	Vessel transits to San Joaquin River. The crew will collect <i>C. Fluminea</i> from the San Joaquin river area close to the historical RMP bivalve deployment site. At least 150 specimens will be collected.
	1400-1600	Vessel transits to Emeryville Marina. Demobilize vessel. Bivalves for trace organics analysis will be picked up by a BADA representative. Bivalves for analysis of trace elements and condition are stored on dry ice and brought to AMS for processing.

Mooring Examination and Bivalve Retrieval Procedures

All diving operations will be conducted by divers working in pairs and tethered together. The vessel will tie up to the deployment sites and the crew will attach a safety line to the structure. Divers will enter the water, descend to the bottom and locate the ground line to the deployment mooring. When the ground line has been located, its attachment to the piling will be examined by feeling for abrasion and looseness in the knots and cable ties. After examination, divers will proceed along the ground line checking its integrity. At the mooring, the earth anchors will be checked to confirm that they have not worked out of the bottom and that serious erosion of bottom sediments has not occurred. All knots will be checked for integrity and the presence of intact cable ties. When the integrity of all lines and knots has been verified and any problems have been corrected, divers will ascend the mooring line to the bivalve bags and cut the cable ties holding the bags to the mooring line. Divers will then return to the surface by retracing their route along the ground line and piling.

When the bivalves are onboard the vessel, they will be carefully removed from the bags and packaged for shipment to the analytical laboratories. Initially, the bags of bivalves will be removed from the mesh bags and placed into a cleaned (scrubbed with Alconox and rinsed with ambient water) cooler. Dead bivalves will be counted and discarded. Approximately 80% of the live organisms will be equally divided for trace organic and trace metal analyses, with the remaining 20% being saved for analysis of condition. The bivalves for organic analyses will be wrapped in aluminum foil, placed into Ziploc bags and frozen on dry ice. Bivalves for trace metal analyses will be placed into doubled Ziploc bags and frozen on dry ice. Bivalves for analysis of condition will be cleaned, sealed shut with cable ties, air-dried, placed into Ziploc bags and frozen on dry ice. All bags will be labeled by station, date, species and quantity. Bivalves will remain frozen on-board the vessel until the conclusion of the cruise.

At the conclusion of the cruise, the bivalves for trace organics analysis will be picked up by a BADA representative. Bivalves for trace metals analyses will remain with AMS for tissue homogenization scheduled for September 14-17. Homogenized bivalves will be shipped to BADA following the homogenization. Bivalves for condition analyses will be retained by AMS.

Species Deployed and Site Locations

The number and species of bivalves deployed at each site are shown in Table 1. The location (Latitude, Longitude) for the deployment sites are listed in Table 2.

Table 1. Bivalve species deployed at each site.

Site Name/Code	Date	Quantity and Species Deployed
Coyote Creek/BA10	6/2/98	144 <i>C. gigas</i>
Dumbarton Bridge/BA30	6/2/98	160 <i>M. californianus</i> 144 <i>C. gigas</i>
Redwood Creek/BA40	6/2/98	160 <i>M. californianus</i>
Alameda/BB71	6/2/98	160 <i>M. californianus</i>
Yerba Buena Island/BC10		160 <i>M. californianus</i>
Horseshoe Bay/BC21	6/3/98	160 <i>M. californianus</i>
Red Rock/BC60	6/3/98	160 <i>M. californianus</i>
Pinole Point/BD30	6/3/98	160 <i>M. Californianus</i> 144 <i>C. gigas</i>
San Pablo Bay/BD20	6/3/98	144 <i>C. gigas</i>
Petaluma River/BD15	6/3/98	144 <i>C. gigas</i>
Davis Point/BD40	6/5/98	144 <i>C. gigas</i>
Napa River/BD50	6/3/98	144 <i>C. gigas</i>
Grizzly Bay/BF20	6/4/98	144 <i>C. gigas</i>
Sacramento River/BG20	-	No bivalves deployed
San Joaquin River/BG30	-	No bivalves deployed

Table 2. Location of bivalve moorings for the 1998 Regional Monitoring Program.

Site Name/Code	Latitude (N)	Longitude (W)	Comments
Coyote Creek BA10	37° 28.19'	122° 03.83'	Channel marker "18"
Dumbarton Bridge BA30	37° 30.80'	122° 08.08'	Channel marker "14"
Redwood Creek BA40	37° 32.82'	122° 11.70'	Channel marker "4"
Alameda BB71	37° 41.73'	122° 20.38'	Channel marker "1" 1.65 nmi. SE of Hunters Point

Site Name/Code	Latitude (N)	Longitude (W)	Comments
Yerba Buena Island BC10	37° 48.35'	122° 22.25'	Dolphin 0.1 nmi. N of Bay Bridge
Horseshoe Bay BC21	37° 49.87'	122° 28.65'	Dolphin 100 ft W of fishing pier
Red Rock BC60	37° 55.70'	122° 28.13'	Channel marker "2" for Larkspur ferry terminal
Pinole Point BD30	38° 01.00'	122° 22.05'	Channel marker "P"
San Pablo Bay BD20	38° 02.72'	122° 25.71'	Channel marker "1"
Petaluma River BD15	38° 06.77'	122° 30.05'	NE end of railroad bridge

Davis Point, (midchannel), SAN PABLO BAY Latitude: 38° 04' N Longitude: 122° 16' W

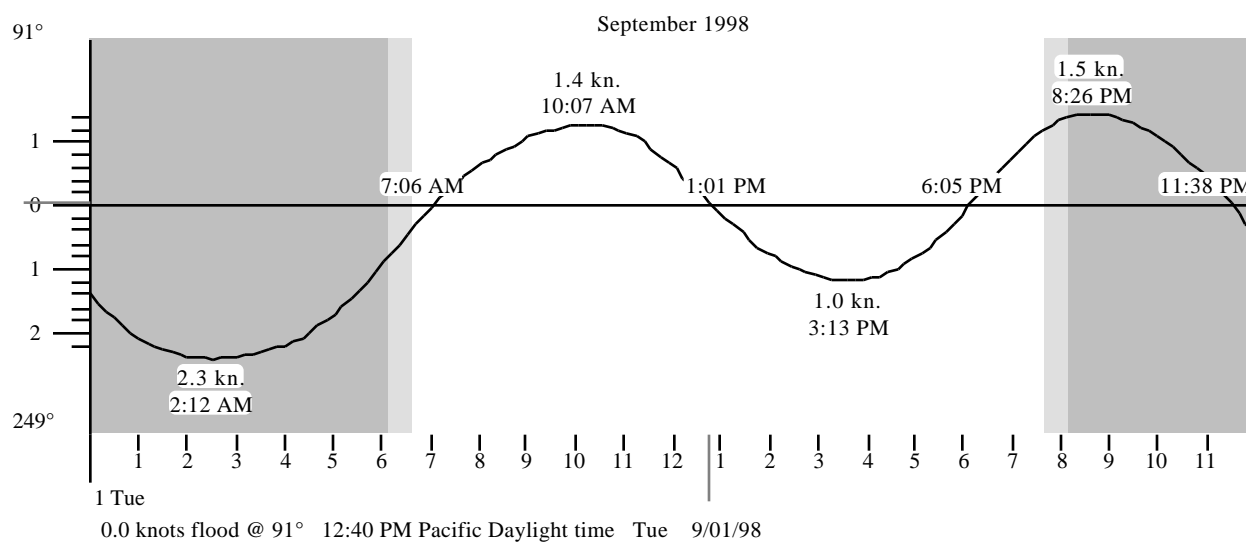


Figure 1. Currents for Davis Point, September 1, 1998.

Oyster Point, 2.8 miles east of, South SAN FRANCISCO BAY Latitude: 37° 40' N Longitude: 122° 19' W

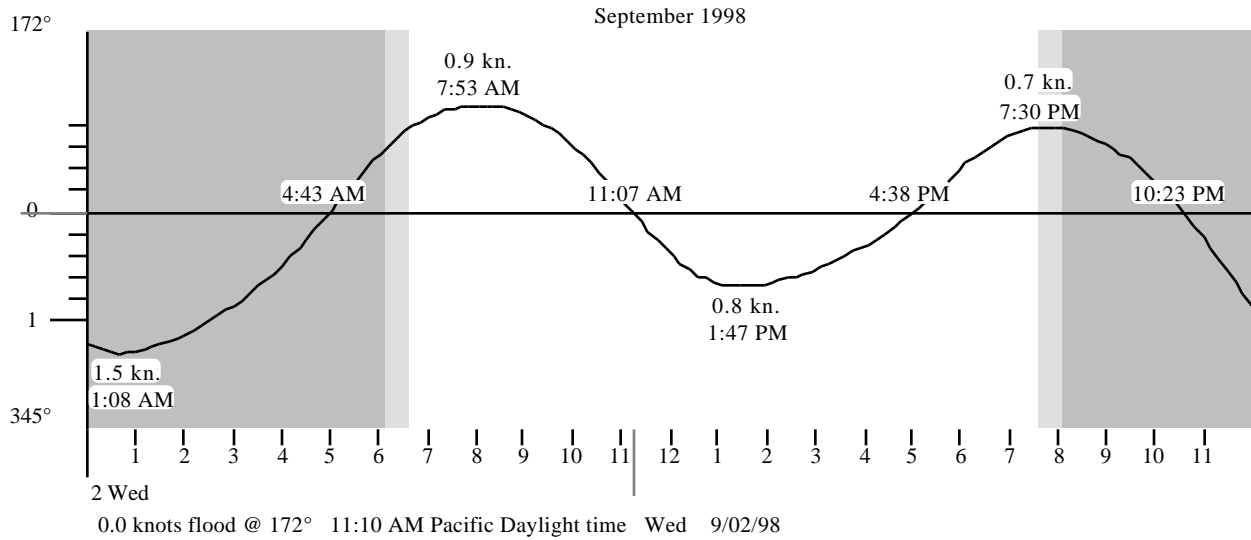


Figure 2. Currents for Oyster Point, September 2, 1998.

Point San Pablo, midchannel, SAN PABLO BAY Latitude: 37° 58' N Longitude: 122° 26' W

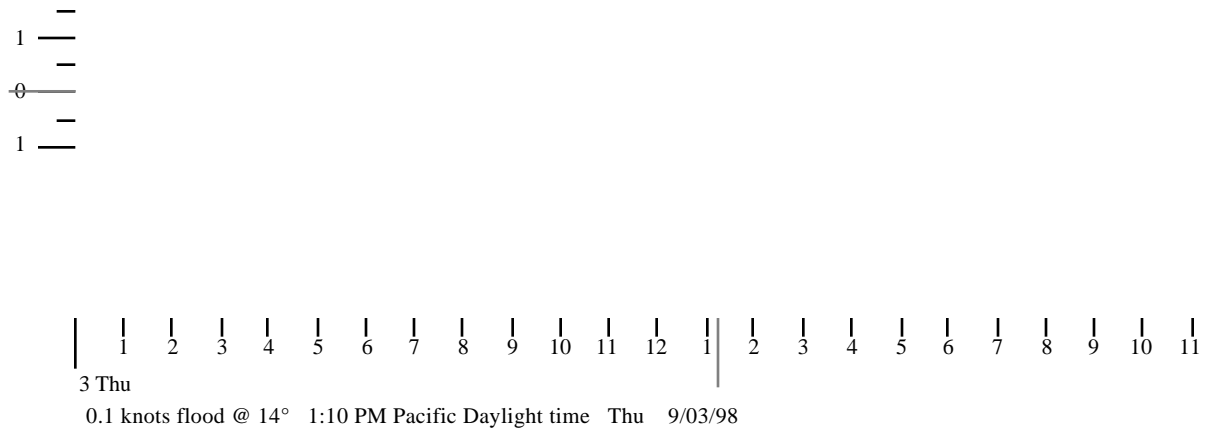


Figure 3. Currents for San Pablo Bay, September 3, 1998.

Point Sacramento, 0.3 mile NE OF, SACRAMENTO RIVER Latitude: 38° 04' N Longitude: 121° 50' W

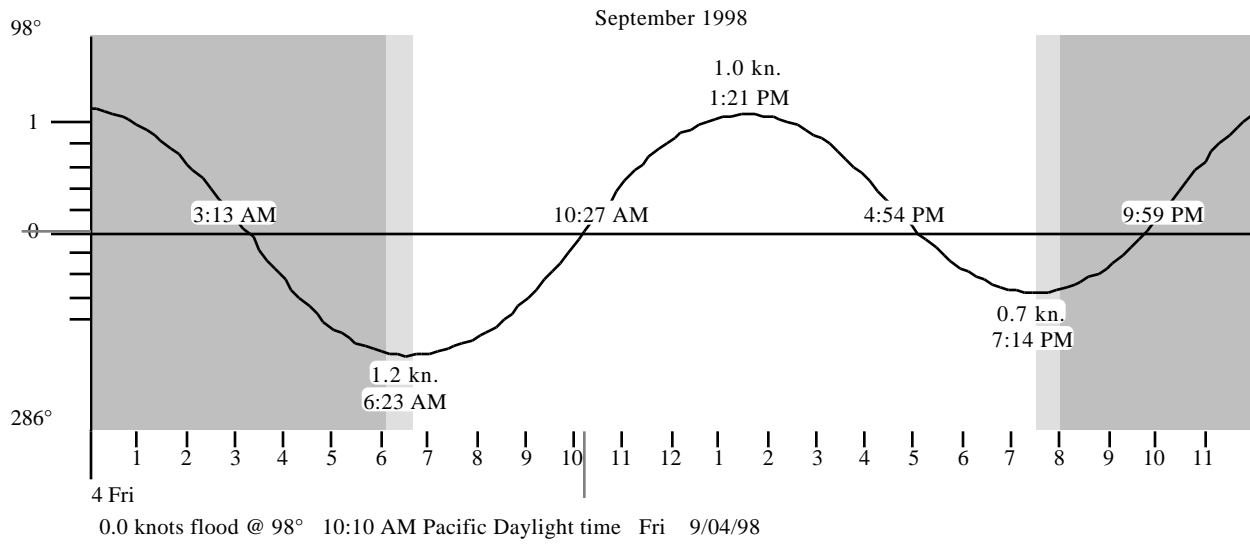


Figure 4. Currents for Point Sacramento, September 4, 1998.